

MEG Energy

Rail Loaded Dilbit

SECTION 1. IDENTIFICATION

Product Identifier	MEG Energy Rail Loaded Dilbit
Other Means of Identification	Produced Crude
Other Identification	Sour Crude, Sour Oil
Product Family	Crude Oil
Recommended Use	Refinery feedstock.
Manufacturer / Supplier	MEG Energy, Christina Lake Regional Project P.O. Box 21008, Fort McMurray, Alberta, T9H 5B2
Emergency Phone No.	Terrapure Environmental, 1-800-567-7455, (24 hr) CANUTEC, 1-613-996-6666, (24 hr)

SECTION 2. HAZARDS IDENTIFICATION

GHS Classification

Flammable liquid - Category 1; Acute toxicity (Oral) - Category 2; Acute toxicity (Dermal) - Category 3; Acute toxicity (Inhalation) - Category 2; Skin corrosion/irritation - Category 2; Serious eye damage/eye irritation - Category 2A



Other Hazards

EMERGENCY OVERVIEW :

FLAMMABLE LIQUID AND VAPOUR. Extremely flammable. May form flammable/explosive vapour-air mixtures. Electrostatic charges may be generated during handling. Electrostatic discharges may cause fire. CONTAINS HYDROGEN SULPHIDE. Product may contain hazardous quantities of dissolved hydrogen sulphide gas. H2S has a broad range of effects dependent on the airborne concentration and length of exposure: 0.02 ppm odor threshold, smell of rotten eggs; 10 ppm eye and respiratory tract irritation; 100 ppm coughing, headache, dizziness, nausea, eye irritation, loss of sense of smell in minutes; 200 ppm potential for pulmonary edema after >20-30 minutes; 500 ppm loss of consciousness after short exposures, potential for respiratory arrest; >1000 ppm immediate loss of consciousness, may lead rapidly to death, prompt cardiopulmonary resuscitation may be required. Do not depend on sense of smell for warning. H2S causes rapid olfactory fatigue (deadens sense of smell). There is no evidence that H2S will accumulate in the body tissue after repeated exposure.

HIGHLY FLAMMABLE : Will be easily ignited by heat, sparks, or flames.

Vapors may form explosive mixtures with air.

Vapors may travel to source of ignition and flash back.

Most vapors are heavier than air. They will spread along the ground and collect in low or confined areas (sewers, basements, tanks).

Vapor explosion hazard indoors, outdoors, or in sewers.

Runoff to sewer may create fire or explosion hazard.

General Hygiene Comments :

Do NOT eat, drink or store food in work areas.

Remove contaminated clothing and protective equipment before entering eating areas or leaving work area.

Wash hands thoroughly after handling this product and before eating, using the washroom or leaving work area.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name	CAS No.	%	Other Identifiers
Hydrogen Sulphide	7783-06-4	5 - 10 ppm	
Crude Oil	8002-05-9	100	
Ethane	74-84-0	0.00 - 0.03	
Propane	74-98-6	0.00 - 0.05	
Isobutane	75-28-5	0.05 - 0.15	
n-Butane	106-97-8	0.25 - 0.75	
Isopentane	78-78-4	3.50 - 4.00	
n-Pentane	109-66-0	3.25 - 3.75	
Hexanes	110-54-3	3.50 - 4.00	
Heptanes	142-82-5	1.75 - 2.25	
Octanes	111-65-9	1.25 - 1.75	
Nonanes	111-84-2	0.75 - 1.25	
Decanes	124-18-5	0.50 - 1.00	
Benzene	71-43-2	0.10 - 0.50	
Toluene	108-88-3	0.25 - 0.75	
Ethylbenzene	100-41-4	0.00 - 0.05	
Xylene (mixed isomers)	1330-20-7	0.25 - 0.75	

Notes

Concentrations are expressed in % weight/weight.

H2S : Identified as Potential Inhalation Hazard.

Hydrogen sulphide content may vary at the time of loading.

SECTION 4. FIRST-AID MEASURES

First-aid Measures

Inhalation

Move to fresh air. Keep at rest in a position comfortable for breathing. If the victim has difficulty breathing or tightness in the chest, is dizzy, vomiting, or unresponsive, administer oxygen with rescue breathing or CPR as required. If breathing has stopped, trained personnel should begin rescue breathing. Obtain medical attention immediately.

Skin Contact

Avoid direct contact. Wear chemical protective clothing if necessary. Take off contaminated clothing, shoes and leather goods (e.g. watchbands, belts). Immediately wash gently and thoroughly with lukewarm, gently flowing water and mild soap for 15-20 minutes.

Eye Contact

Immediately rinse the contaminated eye(s) with lukewarm, gently flowing water for 15-20 minutes, while holding the eyelid(s) open. If eye irritation persists, get medical advice/attention.

Ingestion

Rinse mouth with water. Immediately call a Poison Centre or doctor. Do not induce vomiting.

Most Important Symptoms and Effects, Acute and Delayed

If inhaled:

Can irritate the nose and throat. Symptoms may include headache, nausea, dizziness, drowsiness and confusion.

If in eyes:

May cause moderate to severe irritation. Symptoms include sore, red eyes, and tearing.

If swallowed:

Small amounts can irritate the mouth, throat and stomach.

Large amounts can cause severe and/or permanent organ damage, even death.

SECTION 5. FIRE-FIGHTING MEASURES

Suitable Extinguishing Media

Small fire: Carbon dioxide, dry chemical powder, appropriate foam, water spray or fog.

Large fire: Water spray, fog or regular foam.

Do not use straight streams.

Move containers from fire area if you can do it without risk.

Fire involving Tanks or Car/Trailer Loads:

Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.

Cool containers with flooding quantities of water until well after fire is out.

Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.

ALWAYS stay away from tanks engulfed in fire.

For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.

Specific Hazards Arising from the Chemical

PRODUCT CONTAINS HYDROGEN SULPHIDE. May accumulate in hazardous amounts in low-lying areas especially inside confined spaces, resulting in a health hazard. May accumulate in hazardous amounts in low-lying areas especially inside confined spaces, resulting in a fire hazard.

Special Protective Equipment and Precautions for Fire-fighters

Fight fire from a safe distance or a protected location. For a massive fire, immediately evacuate the area and use unmanned hose holder or monitor nozzles.

Chemical protective clothing (e.g. chemical splash suit) and positive pressure SCBA may be necessary.

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment, and Emergency Procedures

Evacuate the area immediately. Isolate the hazard area. Keep out unnecessary and unprotected personnel. Evacuate downwind locations. Use the personal protective equipment recommended in Section 8 of this safety data sheet. Do not touch damaged containers or spilled product unless wearing appropriate protective equipment. Eliminate all ignition sources. Use grounded, explosion-proof equipment. Before entry, especially into confined areas, check atmosphere with an appropriate monitor.

Environmental Precautions

Do not allow into any sewer, on the ground or into any waterway. If the spill is inside a building, prevent product from entering drains, ventilation systems and confined areas. Minimize the use of water to prevent environmental contamination.

Methods and Materials for Containment and Cleaning Up

Small spills or leaks: stop or reduce leak if safe to do so. Contain and soak up spill with absorbent that does not react with spilled product. Do NOT use combustible materials such as sawdust. Place used absorbent into suitable, covered, labelled containers for disposal.

Large spills or leaks: dike spilled product to prevent runoff. Do not direct water at spill or source. Knock down vapour with fog or fine water spray.

Other Information

Report spills to local health, safety and environmental authorities, as required.

SECTION 7. HANDLING AND STORAGE

Precautions for Safe Handling

Prevent uncontrolled release of product. Eliminate heat and ignition sources such as sparks, open flames, hot surfaces and static discharge. Post "No Smoking" signs. Do not use near welding operations or other high energy sources. Do not weld, cut or perform hot work on empty container until all traces of product have been removed. Electrically bond and ground equipment. Ground clips must contact bare metal. Do not carry or transfer this product in an enclosed

space (e.g. in an elevator or inside a vehicle). Wear personal protective equipment to avoid direct contact with this chemical. Do not puncture or incinerate container even when empty.

Conditions for Safe Storage

Store in an area that is: cool, temperature-controlled, well-ventilated, separate from incompatible materials (see Section 10: Stability and Reactivity), clear of combustible and flammable materials (e.g. old rags, cardboard), out of direct sunlight and away from heat and ignition sources.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control Parameters

Not available.

Consult local authorities for provincial exposure limits.

Appropriate Engineering Controls

Use non-sparking ventilation systems, approved explosion-proof equipment and intrinsically safe electrical systems in areas where this product is used and stored.

Individual Protection Measures

Eye/Face Protection

Wear chemical safety goggles.

Skin Protection

Avoid repeated or prolonged skin contact. Wear chemical protective clothing e.g. gloves, aprons, boots.

Respiratory Protection

PRODUCT CONTAINS HYDROGEN SULPHIDE. For routine situations where potential exposure to harmful vapours is a possibility: wear a NIOSH approved self-contained breathing apparatus (SCBA) or supplied air respirator.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Basic Physical and Chemical Properties

Appearance	Brown - black liquid.
Odour	Hydrocarbon, moderate to strong rotten egg
Odour Threshold	~ 0.1 ppm (Hydrogen Sulphide) (detection and recognition) Causes olfactory fatigue.
pH	Not applicable
Melting Point/Freezing Point	Not available (melting); Not available (freezing)
Flash Point	< 20 °C
Evaporation Rate	Not available
Flammability (solid, gas)	Not applicable (liquid).
Upper/Lower Flammability or Explosive Limit	~ 8.0% (estimated) (upper); ~ 0.8% (estimated) (lower)
Vapour Pressure	64.1 kPa at 37.8°C (100°F)
Vapour Density (air = 1)	> 1 (estimated)
Relative Density (water = 1)	0.915 - 0.940 at 15 °C
Solubility	Practically insoluble in water; Highly soluble in common organic solvents.
Partition Coefficient, n-Octanol/Water (Log Kow)	Not available
Auto-ignition Temperature	>= 215 °C (estimated) (Heptanes)
Decomposition Temperature	Not available
Viscosity	55.50 centistokes at 40°C (104°F) (kinematic)
Other Information	
Physical State	Liquid
Molecular Formula	Not available

Molecular Weight	Not available
Initial Boiling Point	34°C
Corrosivity Rating	NACE Rating : A (TM0172 : Corrosivity in Pipelines Method)

SECTION 10. STABILITY AND REACTIVITY

Reactivity

Not reactive under normal conditions of use.

Chemical Stability

Normally stable.

Possibility of Hazardous Reactions

Not sensitive to mechanical impact.

Conditions to Avoid

Heat. High temperatures. Open flames, sparks, static discharge, heat and other ignition sources. Incompatible materials.

Incompatible Materials

Strong oxidizing agents (e.g. perchloric acid).

Hazardous Decomposition Products

Very toxic carbon monoxide, carbon dioxide; corrosive sulfur oxides; corrosive, oxidizing nitrogen oxides.

SECTION 11. TOXICOLOGICAL INFORMATION

Likely Routes of Exposure

Inhalation; skin contact; eye contact; ingestion.

Acute Toxicity

Chemical Name	LC50	LD50 (oral)	LD50 (dermal)
Ethane	Not available	Not available	Not available
Propane	> 800000 ppm (rat) (30-minute exposure)	Not available	Not available
Isobutane	368000 mg/kg (male mouse) (4-hour exposure) (vapour)	Not available	Not available
n-Butane	658 mg/L (rat) (4-hour exposure)	Not available	Not available
Isopentane	140000 ppm (mouse) (2-hour exposure) (vapour)	Not available	Not available
n-Pentane	6106 ppm (rat) (4-hour exposure)	> 2000 mg/kg (rat)	Not available
Hexanes	73680 ppm (rat) (4-hour exposure) (vapour)	32290 mg/kg (male rat)	> 3295 mg/kg (rabbit)
Heptanes	~ 25000 ppm (rat) (4-hour exposure)	> 15000 mg/kg (rat)	Not available
Octanes	25250 ppm (rat) (4-hour exposure)	Not available	Not available
Nonanes	3200 ppm (rat) (4-hour exposure)	> 15000 mg/kg	Not available
Decanes	72300 mg/m ³ (mouse) (2-hour exposure) (aerosol)	Not available	Not available
Benzene	13700 ppm (rat) (4-hour exposure)	930 mg/kg (rat)	> 8240 mg/kg (rabbit)

Toluene	7585 ppm (rat) (4-hour exposure)	5580 mg/kg (male rat)	12125 mg/kg (rabbit)
Ethylbenzene	~ 4000 ppm (rat) (4-hour exposure)	3500 mg/kg (rat)	15380 mg/kg (rabbit)
Xylene (mixed isomers)	6350 ppm (male rat) (4-hour exposure)	3523 mg/kg (rat)	Not available
Hydrogen Sulphide	444 ppm (rat) (4-hour exposure)	Not available	Not available

Skin Corrosion/Irritation

May cause mild irritation based on information for closely related chemicals.

Slight to moderate irritant. Contact may cause irritation to the skin and mucous membranes upon prolonged and/or repeated skin contact. Prolonged or repeated contact to petroleum oil with skin may cause defatting of the skin leading to redness, itching, inflammation, cracking, dermatitis (rash).

Serious Eye Damage/Irritation

May cause serious eye irritation based on information for closely related materials.

May cause moderate to severe irritation. Symptoms include sore, red eyes, and tearing.

STOT (Specific Target Organ Toxicity) - Single Exposure

Inhalation

Depression of the central nervous system. Symptoms may include headache, nausea, dizziness, drowsiness and confusion.

Can irritate the nose and throat. Symptoms may include headache, nausea, dizziness, drowsiness and confusion.

Hydrogen sulphide is extremely toxic. Product may evolve hazardous concentrations with minimal agitation. VERY TOXIC, can cause death.

Skin Absorption

Liquid may be absorbed through the skin if large areas of skin are exposed.

Ingestion

May cause gastrointestinal irritation. Symptoms may include abdominal pain, stomach upset, nausea, vomiting, and diarrhea.

If small amounts are ingested: can irritate the mouth, throat and stomach.

If large amounts are ingested: harmful.

Aspiration Hazard

Not known to be an aspiration hazard.

STOT (Specific Target Organ Toxicity) - Repeated Exposure

Material in general is not expected to cause harm.

Although the material in general is not considered to have chronic effects, it may contain benzene, a listed carcinogen. Refer to Section 11 of the MSDS for more detailed information.

Respiratory and/or Skin Sensitization

Not a respiratory sensitizer. Not a skin sensitizer.

Carcinogenicity

Chemical Name	IARC	ACGIH®	NTP	OSHA
Benzene		A1		

Material contains benzene, a known carcinogen. Material in general is not expected to cause harm.

The material in general is not considered a carcinogen, however, all appropriate precautions should still be taken due to the presence of trace amounts of benzene in the product.

Reproductive Toxicity

Development of Offspring

Material in general is not expected to cause harm.

The material in general is not expected to produce teratogenic or embryotoxic effects.

Sexual Function and Fertility

Material in general is not expected to cause harm.

The material in general is not expected to have toxic reproductive effects.

Germ Cell Mutagenicity

Material in general is not expected to cause harm.

The material in general is not expected to produce mutagenic effects.

Interactive Effects

No information was located.

SECTION 12. ECOLOGICAL INFORMATION

Toxicity

Studies were not located.

Persistence and Degradability

No ingredient of this product or its degradation products is known to be highly persistent.

Bioaccumulative Potential

This product and its degradation products are not expected to bioaccumulate.

Mobility in Soil

If released into the environment, this product is expected to move slowly through the soil, based on physical and chemical properties. Contamination of groundwater could occur. If released into soil, this material will absorb and may biodegrade in anaerobic conditions. In water it may become volatile. Photo-oxidation products may include phenol, nitrophenols, nitrobenzene, formic acid.

SECTION 13. DISPOSAL CONSIDERATIONS

Disposal Methods

Contact local environmental authorities for approved disposal or recycling methods in your jurisdiction. This product and its container must be disposed of as hazardous waste. Do NOT dump into any sewers, on the ground or into any body of water.

SECTION 14. TRANSPORT INFORMATION

Regulation	UN No.	Proper Shipping Name	Transport Hazard Class(es)	Packing Group
Canadian TDG	1267	Petroleum Crude Oil (Petroleum Crude Oil)	3	I
US DOT	1267	Petroleum Crude Oil (Petroleum Crude Oil)	3	I

Environmental Hazards Potential Marine Pollutant

Special Precautions for User Not applicable

Transport in Bulk According to Annex II of MARPOL 73/78 and the IBC Code

Not applicable

Emergency Response GUIDE 128
Guide No.

SECTION 15. REGULATORY INFORMATION

Safety, Health and Environmental Regulations

Canada

WHMIS Classification



Product Identifier:

MEG Energy

Date of Preparation:

June 10, 2015

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Class B2 Class D1A Class D2A; D2B

B2 - Flammable Liquid; D1A - Very Toxic; D2A - Very Toxic; D2B - Toxic (Skin irritant; Eye irritant)

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the SDS contains all of the information required by the Controlled Products Regulations.

Domestic Substances List (DSL) / Non-Domestic Substances List (NDSL)

Listed on the DSL.

SECTION 16. OTHER INFORMATION

NFPA Rating	Health - 1 Flammability - 3 Instability - 0
SDS Prepared By	Maxxam Analytics
Phone No.	1-800-386-7247
Date of Preparation	June 10, 2015
Key to Abbreviations	ACGIH® = American Conference of Governmental Industrial Hygienists OSHA = US Occupational Safety and Health Administration RTECS® = Registry of Toxic Effects of Chemical Substances
References	CHEMINFO database. Canadian Centre for Occupational Health and Safety (CCOHS). Registry of Toxic Effects of Chemical Substances (RTECS®) database. Accelrys, Inc. Available from Canadian Centre for Occupational Health and Safety (CCOHS).
Disclaimer	This MSDS provides safety information and was developed for employees, customers and agents of MEG Energy Corp. from data obtained from the sample(s) submitted for analysis. The information may not be valid or complete if the product or material is used in combination with other products or materials, or in any process. This information is intended for reasonable normal usage and recommended practices, and to underscore the potential hazards that may be inherent to the nature of the product or material. Although every effort is made to ensure accuracy and completeness of the contained information, it is understood that Maxxam Analytics makes no warranty as to the accuracy or completeness of information and assumes no liability for any damage or loss suffered as result of any inaccuracy or incompleteness therein. This information is considered to be as accurate as possible, as of the date of preparation. The reader is invited to contact MEG Energy Corp. at the address shown to insure the information is up to date or to obtain further information related to an unusual or other use.

MSDS related sample(s) :

Canexus Bruderheim Rail Loading (TK 101 Recycle)

MEG General Emergency Contact : 1-800-575-1400 (24 hr)

Product Identifier: MEG Energy

Date of Preparation: June 10, 2015

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